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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. | | |
|---|-------------|-----------------------|---------------------|------------------|--|--|
| 10/808,691 | 03/25/2004 | John William Kostenko | FKL-017 | 6065 | | |
| 37694 | 7590 | 09/11/2007 | EXAMINER | | | |
| WOOD, HERRON & EVANS, LLP (TOKYO ELECTRON) 2700 CAREW TOWER 441 VINE STREET CINCINNATI, OH 45202 | | | CHAUDHRY, SAEED T | | | |
| ART UNIT | | PAPER NUMBER | | | | |
| 1746 | | | | | | |
| NOTIFICATION DATE | | | DELIVERY MODE | | | |
| 09/11/2007 | | | ELECTRONIC | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | |
|------------------------------|-------------------|-----------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/808,691 | KOSTENKO ET AL. |
| | Examiner | Art Unit |
| | Saeed T. Chaudhry | 1746 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 05 July 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-24, 28, 29, 32-37, 42 and 43 is/are pending in the application.
- 4a) Of the above claim(s) 6, 7, 14, 15, 17-24, 28, 29, 32-37, 42 and 43 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5, 8-13, 16 and 17 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/25/04.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Election/Restriction

Applicant's election of Group I, claims 1-5, 8-13, and 16-17 in Paper No. 3/12/07 and 7/05/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant's amendments and remarks filed March 21, 2007 have been acknowledged by the examiner and entered. Claims 25-27, 30-31 and 44-46 have been canceled and claims 1-24, 28-29 and 32-43 are pending in this application. Of the above 6, 7, 14, 15, 18-24, 28-29, 32-43 has been withdrawn from consideration.

Applicant is advised that should claims 2-5 be found allowable, claims 10-13 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5, 8-13 and 16-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification only support RF power for forming plasma. Claims 1 and 10 recite “applying power”, which include other type of powers such as thermal power.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori et al in view of Su et al and Niino et al.

Hattori et al (5,221,450) disclose a method for cleaning a chamber in a batch type process after processing a substrate in the chamber by introducing a gas in the process chamber and forming a plasma by applying an electric potential to an electrode. Wherein the gas is a halogen gas or nitrogen (see claims). The reference fails to disclose a process tube and removing material deposited in the process chamber.

Su et al (5,507,874) disclose a method for removing particulate contaminants from an electrostatic chuck for a semiconductor at a processing station within a plasma processing

chamber provided with a vacuum exhaust capability and adapted for serially processing substrates within a controlled sub-atmospheric environment, comprising: retaining a substrate at the substrate retaining surface of the electrostatic chuck within a plasma processing chamber; communicating into the chamber at least one selected gas; applying electrical energy to the chamber to establish a gas plasma and an associated electric field substantially perpendicular to the substrate-retaining surface of the electrostatic chuck so as to perform a plasma process on the substrate; removing the processed substrate from the electrostatic chuck surface upon completion if the plasma processing; and performing an in-situ electrical or mechanical removal of contaminant particles from the top of the electrostatic chuck surface in the closed chamber prior to introduction of the next substrate to be plasma processed, while maintaining the chamber under a controlled sub-atmospheric environment without opening the chamber to the atmosphere (see claims). Wherein the selected gas is NF₃. The reference fails to disclose a batch type processing.

Niino et al (5,637,153) disclose a process chamber having a process tube that surrounds a substrate holder adapted to hold a plurality of wafers in a vertical stack. Wherein the process tube is cleaned after processing a substrate by introducing cleaning gas such as ClF₃, CF₄, SF₆ and N₂ gas for diluting the cleaning gas (see claims, col. 2, lines 17-27 and col. 19, lines 33-37).

It would have been obvious at the time applicant invented the claimed process to incorporate the cited steps of removing contaminants from the processing chamber of a processing system after processing a substrate as disclosed by Su et al into the process of Hattori et al. Since one would expect that by removing contaminants from a surface by a continuous process or a batch type process would give same results. It is well known in the art to perform a

film processing on a semiconductor surface in a processing tube placed in a chamber as disclosed by Niino et al. Therefore, it would have been obvious at the time applicant invented the claimed process to clean a process tube after processing a semiconductor with a gas plasma as disclosed by Su et al for removing contaminants from the surface of the tube, since it is well known in the art to use a gas plasma for cleaning the contaminants from a surface.

Claims 2-4, 10-12 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori et al in view of Su et al and Niino et al. as applied to claim 1 above, and further in view of Parkhe et al.

Hattori et al, Su et al and Niino et al were discussed supra. However, the references fails to disclose a step of monitoring a signal for stopping of continuing a cleaning process.

Parkhe et al (5,886,865) disclose a method for monitoring a signal of the progress of the cleaning in a process chamber, which determine an intensity level of a signal reached at a threshold value and transmit the cleaning status to a controller. Based upon the signal, the controller 106 performs one of the following : 1, continue performing the cleaning process and continue monitoring; or 2, stopping the cleaning process after determining that the threshold value has been reached (see col. 4, lines 58-63 and col. 6, lines 61-65).

It would have been obvious at the time applicant invented the claimed process to incorporate the cited steps of monitoring the cleaning process as disclosed by Parkhe et al into the process of Hattori et al for automatically performing the cleaning process and to avoid an over etch the surface.

Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori et al in view of Su et al, Niino et al. and Parkhe et al as applied to claim 2 and 10 above, and further in view of Ghanayem et al et al.

Hattori et al, Su et al, Niino et al and Parkhe et al were discussed supra. However, the references fail to use an optical monitoring by light emission.

Ghanayem et al (6,174,373) disclose a method of determining an endpoint of a plasma cleaning process by measuring spectral emissions of a glow discharge of the plasma (see col. 4, lines 7-13).

It would have been obvious at the time applicant invented the claimed process to incorporate the cited steps of monitoring end point of a plasma cleaning process by light emission as disclosed by Ghanayem et al into the process of Hattori et al for the purpose of stopping the cleaning process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed T. Chaudhry whose telephone number is (571) 272-1298. The examiner can normally be reached on Monday-Friday from 9:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Michael Barr, can be reached on (571)-272-1414. The fax phone number for non-final is (703)-872-9306.

When filing a FAX in Gp 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Saeed T. Chaudhry
Patent Examiner**



**MICHAEL BARR
SUPERVISORY PATENT EXAMINER**